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What is claimed as new and desired to be protected by Letters

Patent of the United States is:

1. A semiconductor assembly comprising:

a support structure having a top surface; and

at least one semiconductor die having a top and bottom surface,  
said bottom surface having a smaller area than said top surface of said  
support structure, said at least one semiconductor die being secured at its  
bottom surface to said top surface of said support structure by a flowable  
adhesive material which does not extend past the perimeter of said at least  
one semiconductor die.

2. The semiconductor assembly of claim 1, wherein said support  
structure is a film.

3. The semiconductor assembly of claim 1, wherein said support  
structure is a printed circuit board.

4. The semiconductor assembly of claim 1, wherein said support  
structure is at least one semiconductor die with a top and bottom surface.

5. The semiconductor assembly of claim 1, wherein said flowable adhesive material is an epoxy.

6. The semiconductor assembly of claim 1, wherein said flowable adhesive material covers an area less than or equal to about 90 % of said at least one semiconductor die bottom surface area.

7. The semiconductor assembly of claim 6, wherein said flowable adhesive material covers an area greater than or equal to about 50 % of said at least one semiconductor die bottom surface area.

8. The semiconductor assembly of claim 1, wherein said top surface of said support structure has at least one electrical contact area and a distance between an electrical contact area and said perimeter of said at least one semiconductor die is less than or equal to about 428 microns.

9. The semiconductor assembly of claim 8, wherein a distance between an electrical contact area and said perimeter of said at least one semiconductor die is less than or equal to about 200 microns.

10. The semiconductor assembly of claim 1, wherein said at least one semiconductor die is in electrical communication with at least one electrical contact area provided on said support structure.

11. The semiconductor assembly of claim 10, wherein said electrical communication is through a wire bond.

12. The semiconductor assembly of claim 10, wherein said at least one electrical contact area is a bonding pad.

5 13. The semiconductor assembly of claim 10, further comprising an encapsulating material for encapsulating said die, electrical communication, and at least a portion of said support structure.

10 14. The semiconductor assembly of claim 13, wherein said encapsulating material fills in at least some portion of a space between said bottom surface of said die and said top surface of said support structure.

15 15. A semiconductor assembly comprising:

a first semiconductor die having a top and a bottom surface; and

a second semiconductor die having a top and bottom surface, said bottom surface having a smaller area than said top surface of said first semiconductor die, said second die being secured at its bottom surface to said top surface of said first semiconductor die by a flowable adhesive material which does not extend past the perimeter of said second semiconductor die.

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16. The semiconductor assembly of claim 15, wherein said first semiconductor die is secured to a support structure.

17. The semiconductor assembly of claim 16, wherein said support structure is a film.

18. The semiconductor assembly of claim 16, wherein said support structure is a printed circuit board.

19. The semiconductor assembly of claim 15, wherein said flowable adhesive material is epoxy.

20. The semiconductor assembly of claim 15, wherein said flowable adhesive material covers an area less than or equal to about 90% of said second semiconductor die's bottom surface area.

21. The semiconductor assembly of claim 20, wherein said flowable adhesive material covers an area greater than or equal to about 50% of said second semiconductor die's bottom surface area.

22. A semiconductor assembly comprising:

a first semiconductor die having a top and a bottom surface;

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a second semiconductor die having a top and a bottom surface,  
said bottom surface having a smaller area than said top surface of said first  
semiconductor die;

5 a third semiconductor die having a top and a bottom, said bottom  
surface having a smaller area than said top surface of said first  
semiconductor die, said second and third semiconductor dies being  
secured at their bottom surface to said top surface of said first  
semiconductor die by a flowable adhesive material which does not extend  
past the perimeter of said second semiconductor die or said third  
10 semiconductor die.

23. The semiconductor assembly of claim 22, wherein said bottom  
surface of said first semiconductor die is secured to a support structure.

24. The semiconductor assembly of claim 22, wherein said flowable  
adhesive material is epoxy.

15 25. The semiconductor assembly of claim 24, wherein said flowable  
adhesive material covers an area less than or equal to about 90% of said  
second semiconductor die's bottom surface area and said third  
semiconductor die's bottom surface area.

26. The semiconductor assembly of claim 22, wherein said flowable adhesive material covers an area greater than or equal to about 50% of said second and said third semiconductor die's bottom surface area.

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27. A semiconductor assembly comprising:

5 a support structure;

a first semiconductor die having a top and bottom surface, said bottom surface being secured to said support structure; and

10 a second semiconductor die having a top and bottom surface, said bottom surface having a smaller area than said top surface of said first semiconductor die, said second die being secured at its bottom surface to said top surface of said first semiconductor die by a flowable adhesive material which does not extend past the perimeter of said second die.

15 28. The semiconductor assembly of claim 27, wherein said top surface of said first semiconductor die has at least one electrical contact area and a distance between an electrical contact area and said perimeter of said second semiconductor die is less than or equal to about 428 microns.

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29. The semiconductor assembly of claim 28, wherein a distance between an electrical contact area on said top surface of said first semiconductor die and said perimeter of said second semiconductor die is less than or equal to about 200 microns.

5 30. The semiconductor assembly of claim 27, wherein at least one of said first and said second semiconductor dies are in electrical communication with said support structure.

31. The semiconductor assembly of claim 27, wherein said second semiconductor die is in electrical communication with an electrical  
10 contact area on said first semiconductor die.

32. A method of manufacturing a semiconductor assembly comprising:  
  
depositing a flowable adhesive material on a bottom surface of a semiconductor die;

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15 providing a supporting structure for said at least one semiconductor die, wherein said supporting structure has a perimeter greater than a perimeter of said at least one semiconductor die and has at least one electrical contact area located adjacent an edge of said semiconductor die; and



applying a force between said at least one semiconductor die and said supporting structure causing said flowable adhesive to flow but not extend past the perimeter of said at least one semiconductor die.

33. The semiconductor assembly of claim 32, wherein, said flowable adhesive material covers an area greater than or equal to about 50% and less than or equal to about 90% of said bottom surface of said at least one semiconductor die.

34. A method of forming a semiconductor assembly comprising the steps of:

providing a first semiconductor die having a top and bottom surface and at least one electrical contact area adjacent an edge of said top surface;

providing a second semiconductor die having a top and bottom surface;

depositing a flowable adhesive material on said top surface of said first die so that said flowable adhesive material covers an area no less than or equal to about 50% and no greater than or equal to about 90% of said second die bottom surface area;

pressing said second die against said first die so that said flowable adhesive material flows but does not extend past the perimeter of said second die.

35. The method of claim 34, further comprising the steps of securing  
5 said bottom surface of said first die to a support structure.

36. The method of claim 35, where said support structure is a printed circuit board.

37. The method of claim 35, where said support structure is a film.

38. The method of claim 34, wherein said flowable adhesive material is  
10 an epoxy.

39. A method of forming a semiconductor assembly comprising the steps of:

providing a first semiconductor die having a top and bottom surface and at least one electrical contact area adjacent an edge of said top  
15 surface;

providing a second semiconductor die having a top and bottom surface;

depositing a flowable adhesive material on said bottom surface of said second die so that said flowable adhesive material covers an area  
5 greater than or equal to about 50% and less than or equal to about 90% of said second die bottom surface area;

pressing said second die against said first die so that said flowable adhesive material flows out but does not extend past the perimeter of said second die.

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